Nationally Determined Contributions (NDCs) & Carbon Emissions Reduction

Biggest polluters review 10 years post the COP21

GREENCORE
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NDCs & Carbon Emissions Reduction

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1. The 10 Biggest polluters progress

Since the adoption of the Paris Agreement at COP21 in 2015, the global effort to reduce greenhouse gas (GHG) emissions has intensified, yet unevenly across nations. The distribution of major polluters has remained broadly consistent—with a handful of countries responsible for the majority of global emissions—but their relative shares, underlying drivers, and future trajectories are evolving. The table below presents a comparative snapshot of the world's top GHG emitters in three pivotal moments: 2015 (the year of COP21), 2025 (current status), and 2030 (based on projected emissions under current policies and NDC commitments). This side-by-side view highlights not only progress and setbacks but also the shifting geopolitical weight in the global climate equation.

Rank	2015 (COP21)	2025 (Latest Data)	2030 (Projected)
1	China	China	China
2	United States	United States	India
`3	India	India	United States
4	Russia	Russia	Russia
5	Japan	Japan	Indonesia
6	Germany	Iran	Brazil
7	Iran	Indonesia	Iran
8	South Korea	Saudi Arabia	Saudi Arabia
9	Canada	Germany	Japan
10	Brazil	Canada	Germany

Based on current policies and projections:

1. China – Projected to reach approximately 14,000 million tonnes CO_2e/year, with emissions peaking before 2030.

2. India – Emissions expected to continue rising due to economic growth, though per capita emissions remain below the global average.
3. United States – Emissions projected to decline slightly, reflecting ongoing efforts to reduce greenhouse gas outputs.
4. Russia – Emissions may increase modestly, influenced by energy production trends.
5. Indonesia – Expected to see continued growth in emissions, though per capita figures remain relatively low.
6. Brazil – Projected emissions may rise, but at a slower rate compared to earlier estimates.
7. Iran – Emissions likely to increase, depending on energy sector developments.
8. Saudi Arabia – Emissions may plateau if renewable energy targets are achieved.
9. Japan – Anticipated to maintain or slightly reduce emissions through technological advancements.
10. Germany – Expected to continue reducing emissions in line with EU climate goals.

2. NDCs progress update

As of June 2025, the global landscape of NDCs under the Paris Agreement reveals a mixed picture. While some nations have submitted updated and more ambitious targets, many have missed the February 2025 deadline, raising concerns about collective progress toward limiting global warming to 1.5°C.

United States

The United States has initiated a second withdrawal from the Paris Agreement. On January 20, 2025, President Donald Trump signed Executive Order 14162, titled "Putting America First In International Environmental Agreements," directing the immediate withdrawal of the United States from the Paris Agreement and other international climate commitments.

According to the provisions of the Paris Agreement, a country's withdrawal becomes effective one year after the formal notification is submitted to the United Nations Secretary-General. Therefore, the United States' withdrawal is scheduled to take effect on January 27, 2026.

This marks the second time the U.S. has withdrawn from the Paris Agreement. The first withdrawal occurred during President Trump's initial term, with the U.S. officially exiting on November 4, 2020. Subsequently, under President Joe Biden, the U.S. rejoined the agreement on February 19, 2021.

The recent withdrawal has raised concerns among international climate advocates and policymakers. Critics argue that the U.S.'s exit undermines global efforts to combat climate change and may hinder progress toward emission reduction targets.

Despite the federal government's decision, several U.S. states and local governments have expressed their commitment to uphold the objectives of the Paris Agreement through initiatives like the United States Climate Alliance.

EU

The EU submitted its most recent NDC to the UNFCCC in October 2023.

This updated NDC maintains the EU's commitment to achieving at least a 55% net reduction in greenhouse gas emissions by 2030 compared to 1990 levels. The submission also includes detailed information on the implementation of the "Fit for 55" legislative package, which outlines measures to achieve the 2030 target.

Key Highlights of the EU's 2023 NDC Update:

- *Legally Binding 2030 Emissions Reduction Target*
    - The EU commits to a net reduction of at least 55% in GHG emissions by 2030 relative to 1990 levels. This target encompasses all sectors, including land use, land-use change, and forestry (LULUCF), and is legally binding under the European Climate Law.
- Enhanced Sectoral Targets under "Fit for 55"
    - EU Emissions Trading System (EU ETS): Aims for a 62% reduction in emissions from sectors covered by the ETS by 2030 compared to 2005 levels.
    - Effort Sharing Regulation (ESR): Sets an EU-wide target of a 40% reduction in emissions by 2030 compared to 2005 for sectors not covered by the ETS, such as transport, buildings, agriculture, and waste.
    - LULUCF Regulation: Establishes a binding Union-level target of 310 million tonnes CO_2 equivalent net removals in the LULUCF sector by 2030.
- Expansion of Carbon Pricing Mechanisms
    - Introduction of a separate emissions trading system (ETS2) for fuel combustion in road transport and buildings, set to commence in 2027, aiming for a 42% reduction in emissions by 2030 compared to 2005 levels in the sectors covered.
- Transport Sector Initiatives
    - Legislation mandates a 55% reduction in CO_2 emissions for new cars and a 50% reduction for new vans by 2030, progressing to 100% reductions for both vehicle types from 2035 onwards.
- Renewable Energy and Energy Efficiency Targets
    - Under the RePowerEU plan, the EU sets a target to achieve at least 42.5% renewable energy in final energy consumption by 2030, with an additional 2.5% indicative top-up to reach 45%. Additionally, there is an enhanced target to reduce final energy consumption by 11.7% by 2030.
- Support Mechanisms for a Just Transition

  - Establishment of a Social Climate Fund, allocating up to €65 billion for the period 2026–2032, to assist vulnerable households, micro-enterprises, and transport users in coping with the price impacts of the new emissions trading system for buildings and road transport.

- Joint NDC Submission with Member States
  - The EU and its 27 Member States continue to act jointly under Article 4.2 of the Paris Agreement, submitting a single NDC that outlines collective targets and responsibilities.

- Future Commitments and Reviews
  - The EU plans to set a climate target for 2040, with a legislative proposal expected within six months of the first Global Stocktake, as stipulated by the European Climate Law.

As of June 2025, the EU has not yet submitted its NDC for the 2035 target, which was due by February 2025 under the Paris Agreement's timeline. The delay is attributed to internal political tensions and economic concerns within the bloc.

China

China submitted its most recent NDC to the UNFCCC on 28 October 2021. This submission, titled "China First NDC (Updated submission)," outlines the country's climate goals and strategies.

Key Highlights of China's 2021 NDC:

- CO_2 Emissions Peak: China aims to have CO_2 emissions peak before 2030, advancing from its previous target of peaking "around 2030."
- Carbon Intensity Reduction: The country commits to lowering CO_2 emissions per unit of GDP by over 65% from 2005 levels by 2030, an enhancement from the earlier target of a 60–65% reduction.
- Non-Fossil Fuel Share: China plans to increase the share of non-fossil fuels in primary energy consumption to around 25% by 2030, up from the previous goal of around 20%.
- Wind and Solar Power Capacity: The NDC introduces a new target to boost the combined installed capacity of wind and solar power to over 1,200 gigawatts by 2030.
- Forest Stock Volume: China aims to increase its forest stock volume by 6 billion cubic meters from 2005 levels by 2030, an improvement over the previous target of 4.5 billion cubic meters.
- Carbon Neutrality Goal: China reaffirms its commitment to achieving carbon neutrality before 2060, as outlined in its Long-Term Low Greenhouse Gas Emission Development Strategy submitted alongside the NDC

As of June 2025, China has not yet submitted its NDC for the 2035 target, which was due by 10 February 2025 under the Paris Agreement's timeline. The delay is attributed to internal assessments and policy considerations

India

India submitted its most recent NDC to the UNFCCC on 26 August 2022. This updated NDC outlines India's enhanced climate commitments for the period 2021–2030.

Key Highlights of India's Updated NDC:

- Emission Intensity Reduction: India aims to reduce the emissions intensity of its GDP by 45% by 2030 compared to 2005 levels, an increase from the previous target of 33–35%.
- Non-Fossil Fuel Energy Capacity: The country commits to achieving about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.
- Lifestyle for Environment (LiFE) Initiative: India emphasizes the importance of sustainable lifestyles through the 'LiFE' movement, encouraging environmentally conscious practices.

As of June 2025, India has not submitted its NDC for the 2035 target, which was due by February 2025 under the Paris Agreement's timeline. The delay is attributed to internal assessments and policy considerations.

Russia

Russia submitted its most recent NDC to the UNFCCC in November 2020. This submission outlines Russia's climate goals and strategies up to 2030.

Key Highlights of Russia's 2020 NDC:

- 2030 Emissions Reduction Target
    - Russia aims to limit GHG emissions to 70% of 1990 levels by 2030, accounting for the maximum possible absorptive capacity of forests and other ecosystems.
- Baseline and Accounting Approach
    - The 1990 level is used as the reference point, with total GHG emissions (including emissions and removals from land use, land-use change, and forestry) in 1990 estimated at 3.1 billion tons of CO_2-equivalent.
- Adaptation Measures
    - Russia is developing a national climate change adaptation system, focusing on:
        - Differentiated approaches considering regional and sectoral specifics.
        - Staged and consistent planning processes.
        - Integration of preventive and post-crisis adaptation measures.

- A national action plan for adaptation for the period up to 2022, with a subsequent plan for up to 2025.

- Support for Developing Countries
  - Russia expresses its intention to assist developing countries in achieving the goals of the Paris Agreement through:
    - Joint projects in climate, environmental protection, and energy conservation.
    - Participation in international financial mechanisms like the Green Climate Fund.
    - Capacity-building initiatives, including training specialists in climatology and related fields.
- Domestic Climate Policies
  - Russia's climate policy framework includes:
    - The Climate Doctrine of the Russian Federation (2009), outlining strategic goals for national climate policy.
    - Federal laws and action plans aimed at improving energy efficiency across various sectors.
    - Development of a monitoring, reporting, and verification system for GHG emissions.
- Assessment of Ambition
  - Analyses by organizations such as Climate Action Tracker indicate that Russia's 2020 NDC does not represent an increase in ambition compared to previous commitments. The target is considered "critically insufficient" when compared to modelled domestic pathways and fair share emissions allocations.

Indonesia

Indonesia submitted its Enhanced NDC to the UNFCCC on 23 September 2022. This submission outlines Indonesia's updated climate goals and strategies up to 2030.

Key Highlights of Indonesia's 2022 Enhanced NDC:

- Increased Emissions Reduction Targets
  - Unconditional Target: Indonesia commits to reducing GHG emissions by 31.89% below the business-as-usual (BAU) scenario by 2030, an increase from the previous 29% target.
  - Conditional Target: With international support, Indonesia aims for a 43.20% reduction below BAU by 2030, up from the earlier 41% target.
- Sectoral Coverage
  - The Enhanced NDC encompasses key sectors contributing to GHG emissions:

- Energy
- Waste
- Industrial Processes and Product Use (IPPU)
- Agriculture
- Forestry and Other Land Uses (FOLU)

- Land Restoration Commitments

Indonesia sets ambitious goals for land and ecosystem restoration:

- Restoration of 2 million hectares of peatlands by 2030.
- Rehabilitation of 12 million hectares of degraded lands by 2030.

- Adaptation Strategies

The NDC emphasizes adaptation measures to enhance climate resilience:

- Focus areas include agriculture, coastal zones, ecosystems, water resources, forestry, energy, settlements, and disaster risk management.
- Development of the NDC Adaptation Road Map to guide national development planning.

- Alignment with Long-Term Strategies

Indonesia's Enhanced NDC aligns with its Long-Term Strategy for Low Carbon and Climate Resilience 2050, aiming to:

- Peak national GHG emissions by 2030.
- Progress towards net-zero emissions by 2060 or sooner.

- Implementation and Monitoring

To ensure effective implementation, Indonesia plans to:

- Utilize the Vulnerability Index Data Information System (SIDIK) for adaptation planning.
- Enhance the National Registry System (SRN) for transparency and tracking progress.

Brazil

Brazil submitted its latest NDC to the UNFCCC in November 2024 during COP29 in Baku, Azerbaijan. This submission outlines Brazil's enhanced climate commitments up to 2035, reflecting a significant increase in ambition compared to previous targets.

Key Highlights of Brazil's 2024 NDC:

- Ambitious 2035 Emissions Reduction Target

  - Target Range: Brazil commits to reducing net GHG emissions by 59% to 67% below 2005 levels by 2035.
  - Absolute Emissions: This corresponds to limiting emissions to between 1.05 and 0.85 billion tonnes of CO_2 equivalent by 2035.

- Alignment with Global Climate Goals
  - The NDC aligns with the Paris Agreement's objective of limiting global warming to 1.5°C above pre-industrial levels.
  - It sets a trajectory towards achieving climate neutrality by 2050.
- Deforestation and Land Restoration Commitments
  - Zero Deforestation: Brazil aims to eliminate illegal deforestation and compensate for legal suppression of native vegetation, striving for zero deforestation by 2030.
  - Forest Restoration: Plans include large-scale restoration of native vegetation to enhance carbon sequestration and biodiversity.
- Sectoral Mitigation and Adaptation Plans
  - The NDC introduces a comprehensive Climate Plan comprising:
    - Seven sectoral mitigation plans covering energy, industry, transportation, agriculture, and more.
    - Sixteen adaptation plans addressing areas such as water resources, health, and infrastructure.
- Advancement of Renewable Energy and Emissions Trading
  - Renewable Energy: Brazil plans to expand its already substantial renewable energy capacity, which accounts for approximately 85% of its electricity mix.
  - Emissions Trading System (ETS): Development of a national ETS is underway to facilitate carbon pricing and attract private sector investment.
- Multilevel Governance and Climate Federalism
  - The NDC emphasizes climate federalism, promoting coordinated action among federal, state, and municipal governments.
  - This approach aims to integrate climate policies across all levels of government, enhancing implementation effectiveness.
- Financial Instruments for Climate Action
  - Brazil has issued $2 billion in sustainable sovereign bonds to fund initiatives such as deforestation control, biodiversity conservation, and renewable energy projects.
- Commitment to Climate Justice

- The NDC underscores a vision of climate justice, aiming to address social inequalities and ensure that climate actions contribute to the well-being of all segments of society.

Japan

Japan submitted its latest NDC to the UNFCCC on February 18, 2025. This submission outlines Japan's updated climate goals and strategies up to 2040, setting a trajectory towards achieving net-zero GHG emissions by 2050.

Key Highlights of Japan's 2025 NDC:

- Enhanced Emissions Reduction Targets
  - 2035 Target: Japan commits to reducing GHG emissions by 60% below 2013 levels by fiscal year (FY) 2035.
  - 2040 Target: A further reduction to 73% below 2013 levels by FY 2040 is planned.
  - These targets are designed to follow a linear trajectory from the 46% reduction target set for 2030, aiming towards net-zero emissions by 2050.
- Energy Sector Transformation
  - Renewable Energy: Japan plans to increase the share of renewables in its electricity mix to 40–50% by 2040, up from approximately 23% in 2023.
  - Nuclear Energy: The government aims for nuclear power to contribute 20% of electricity supply by 2040, marking a policy shift from the post-Fukushima nuclear phaseout.
  - Coal Reduction: Coal-fired power generation is targeted to decrease from nearly 70% to 30–40% of the energy mix.
- Policy Framework and Strategies
  - Green Transformation (GX) 2040 Vision: This national strategy integrates decarbonization with industrial policy, focusing on innovation and economic growth.
  - Strategic Energy Plan: The revised plan supports the NDC targets, emphasizing the development of next-generation energy sources and technologies.
- Public Consultation and Submission Timeline
  - The NDC underwent a public comment period, receiving over 3,000 submissions.
- Critiques and Calls for Greater Ambition
  - Environmental groups and some political figures argue that the 60% reduction target by 2035 falls short of the 66% reduction recommended by the Intergovernmental Panel on Climate Change (IPCC) to limit global warming to 1.5°C.

- Within Japan's ruling coalition, the Komeito party has advocated for more ambitious targets to align with IPCC guidelines.

Iran

Iran submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC in November 2015. As of June 2025, Iran has not updated this submission or ratified the Paris Agreement, making it one of the few countries yet to do so. The INDC outlines Iran's climate goals and strategies up to 2030, contingent upon the lifting of international sanctions and the provision of financial and technological support.

Key Highlights of Iran's 2015 INDC:

- Emissions Reduction Targets
  - Unconditional Target: Iran aims to reduce GHG emissions by 4% below the BAU scenario by 2030.
  - Conditional Target: Subject to the removal of sanctions and receipt of international support, Iran could achieve up to a 12% reduction below BAU by 2030.
- Mitigation Strategies

To achieve these targets, Iran plans to implement measures such as:

  - Developing combined-cycle power plants.
  - Expanding renewable and nuclear energy capacities.
  - Reducing gas flaring emissions.
  - Enhancing energy efficiency across various sectors.
  - Substituting high-carbon fuels with natural gas.
  - Promoting economic diversification and participation in market-based mechanisms.

- Adaptation Measures

Recognizing its vulnerability to climate change, Iran has identified key adaptation priorities, including:

  - Improving water resource management to address declining surface runoffs and groundwater storage.
  - Enhancing agricultural productivity and resilience.
  - Combating desertification and soil erosion.
  - Strengthening infrastructure to withstand extreme weather events.

- Financial and Technological Needs

Iran estimates that achieving its unconditional mitigation target would require approximately $17.5 billion, while the conditional target would necessitate around $52.5

billion. These investments are needed for technology transfer, capacity building, and the development of necessary infrastructure.

- Conditionality and Sanctions

Iran emphasizes that the implementation of its INDC is contingent upon:

  - The termination of unjust sanctions imposed on the country.
  - Access to international financial resources and technology transfer.
  - Participation in global carbon markets and mechanisms under the UNFCCC.

- Status and International Engagement

As of June 2025, Iran has not ratified the Paris Agreement, citing ongoing economic sanctions as a significant barrier. The country has indicated that it would consider ratification contingent upon the lifting of these sanctions.

Saudi Arabia

Saudi Arabia submitted its updated NDC to the UNFCCC in October 2021. This submission outlines the Kingdom's enhanced climate goals and strategies up to 2030, reflecting a significant increase in ambition compared to its previous commitments.

Key Highlights of Saudi Arabia's 2021 Updated NDC:

- Enhanced Emissions Reduction Target
  - Saudi Arabia commits to reducing, avoiding, and removing 278 million tons of CO_2-equivalent annually by 2030, more than doubling its previous target of 130 million tons.
- Economic Diversification and Climate Initiatives
  - The NDC emphasizes the Kingdom's Vision 2030, aiming for economic diversification with co-benefits of GHG emissions reduction.
  - Key initiatives include the Saudi Green Initiative, Middle East Green Initiative, Circular Carbon Economy National Program, National Renewable Energy Program, and the Saudi Energy Efficiency Program.
- Renewable Energy and Hydrogen Development
  - Targets achieving 50% of electricity generation from renewable sources by 2030.
  - Plans to become a global leader in green hydrogen production, with projects like the NEOM Green Hydrogen Plant.
- Carbon Capture and Methane Management
  - Development of Carbon Capture, Utilization, and Storage (CCUS) hubs in industrial cities like Jubail and Yanbu.
  - Commitment to zero flaring in the oil and gas industry and participation in the Global Methane Pledge to reduce methane emissions by 30% by 2030.

- Adaptation Measures
    - Focus on water resource management, including expanding desalination and wastewater treatment.
    - Efforts to protect and renew natural environments, including biodiversity of land, seas, and coastlines.
- Monitoring and Reporting
    - Establishment of a national Monitoring, Reporting, and Verification (MRV) system to track progress and ensure transparency.